

CLAIMS

1. An actuator for scanning detecting light, comprising:
an optical element for emitting detecting light;
5 a moveable part supporting the optical element;
a sheet spring having a fixed end and a moveable end supporting the
moveable part; and
drive means for driving the moveable part so as to scan the detecting light.
- 10 2. An actuator for scanning detecting light according to claim 1, wherein the
drive means is provided with a plurality of drive force generating units disposed on
either side of the optical element in such a manner that the combined force of the
drive force produced by the drive force generating units acts substantially onto the
gravitational center of the optical element and moveable part.
- 15 3. An actuator for scanning detecting light according to claim 1, wherein the
drive means consists of an electromagnetic force generating unit, and the moveable
part comprises an electromagnetic coil.
- 20 4. An actuator for scanning detecting light according to claim 1, wherein the
optical element comprises one of a member selected from a group consisting of a
mirror for reflecting detecting light emitted from a laser light emitting means, a
prism for refracting detecting light emitted from a laser light emitting means, a
hologram element for reflecting detecting light emitted from a laser light emitting
25 means, and a detecting light emitting device.

5. An actuator for scanning detecting light according to claim 3, wherein the sheet spring is connected to a fixed part via a flexible circuit board including a circuit for supplying electric current to the electromagnetic coil.

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6. An actuator for scanning detecting light according to claim 3, wherein the sheet spring is provided with a laminated structure including an electrically insulating layer and an electrically conductive layer serving as a circuit for supplying electric current to the electromagnetic coil.

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7. An actuator for scanning detecting light according to claim 3, wherein a vibration control member is affixed to the sheet spring at a part where a relatively large strain is produced in a resonant vibration.

15 8. An actuator for scanning detecting light according to claim 1, wherein the drive means consists of an electromagnetic force generating unit for driving the moveable, and the sheet spring comprises a plurality of sheet spring members disposed one next to another in a major plane of the sheet spring members, the electromagnetic force generating unit being disposed between the sheet spring
20 members.

9. An actuator for scanning detecting light according to claim 8, wherein the each of the sheet spring members has a width which gets narrower from the fixed end to the moveable end.

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10. An actuator for scanning detecting light according to claim 8, wherein the electromagnetic force generating unit comprises an electromagnetic coil attached to the moveable part, the coil receiving a supply of electric current via a circuit partly formed by the sheet spring members.

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11. An actuator for scanning detecting light according to claim 8, wherein the electromagnetic force generating unit comprises a yoke attached to the fixed part, the yoke including a C-shaped member which is folded onto itself to define a gap for receiving the electromagnetic coil.

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12. An actuator for scanning detecting light according to claim 8, wherein the electromagnetic coil is provided with an annular shape, and the yoke is attached to the fixed part so as to extend along the direction of movement of the moveable part and partly fitted into the electromagnetic coil,

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the fixed part being provided with a guide part for guiding the yoke when fitting the yoke into the electromagnetic coil along the direction of movement of the moveable part and attaching the yoke to the fixed part.

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13. An actuator for scanning detecting light according to claim 8, wherein the optical element comprises a member selected from a group consisting of

a mirror for reflecting detecting light emitted from a detecting light emitting means;

a prism or lens for changing the optical direction of detecting light emitted from a detecting light emitting means;

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a hologram for reflecting detecting light emitted from a detecting light

emitting means; and

a detecting light emitting means itself.